PATENT ABSTRACTS OF JAPAN

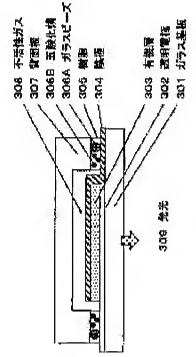
(11)Publication number : **2000-100558**
(43)Date of publication of application : **07.04.2000**

(51)Int.Cl. **H05B 33/04**
H05B 33/14

(21)Application number : **10-264639**
(22)Date of filing : **18.09.1998**

(71)Applicant : **MATSUSHITA ELECTRIC IND CO LTD**
(72)Inventor : **KUDO YUJI**
HORI YOSHIKAZU
FUKUYAMA MASAO
SUZUKI MUTSUMI

(54) **LUMINESCENT DEVICE**



(57)Abstract:
PROBLEM TO BE SOLVED: To provide a high-reliability display element capable of suppressing the expansion of dark spots by suppressing the moisture infiltrating from the outside while keeping firm adhesion.
SOLUTION: An anode 302 made of indium tin oxide for injecting holes, an organic layer 303 containing a luminescent layer, and a cathode layer 304 for injecting electrons are formed sequentially on the surface of a glass substrate 301. A second substrate (back plate) 307 having a recess is installed to face the substrate formed of these films, and a resin 305 containing glass beads 306A with the particle size of about 20 μm and phosphorus pentoxide 306B is filled between the flat portions of the peripheral section of the second substrate 307 where the first substrate and the second substrate 307 are kept in contact with each other to form an adhesive layer. When the electric field is applied between the anode 302 and the cathode 304, holes and electrons are injected into the organic luminescent layer from individual electrodes for luminescence. Light 309 is emitted through the transparent anode 302 and the glass substrate 301. Since glass particles with a fixed particle size and hygroscopic particles are concurrently contained, a long-term storage life can be obtained in the high-temperature and high-humidity environment.

CLAIMS

[Claim(s)]
[Claim 1]A filmy light emitting device is installed in an inside of a substrate of a couple which countered mutually and has been arranged, And a luminescent device when a periphery of a light emitting device is surrounded by a glue line containing two or more particles, moreover separates an interval with a constant substrate of said couple by this glue line and pastes up, wherein adhesion closure of said luminous layer is carried out.
[Claim 2]The 2nd substrate characterized by comprising the following is arranged so that the surface may counter mutually, And a luminescent device, wherein adhesion closure of said luminous layer is carried out by adhering to a glue line which contains two or more particles in a periphery which has the shape of surface type with said 2nd flat substrate, separating an interval with a constant substrate of said 1st and 2nd couples by this glue line moreover, and pasting up.
The 1st substrate that has the shape of flat surface type and with which a filmy light emitting device was formed in the surface.
Shape with the periphery flat at least.

[Claim 3]A filmy light emitting device is the luminescent device installed between the 1st substrate of light reflex nature which has the shape of flat surface type, and the 2nd substrate of a light transmittance state which has the shape of flat surface type, And a luminescent device, wherein it separates an interval with a constant substrate of said couple by this resin layer, it pastes up and adhesion closure of said luminous layer is carried out by surrounding a periphery of a light emitting device by a resin layer containing two or more particles.
[Claim 4]It is a luminescent device characterized by comprising the following which the 2nd substrate used as an inner surface the surface in which a light emitting device was formed, respectively, countered mutually, and has been arranged, And a luminescent device which separates an interval with these both constant light emitting devices, is fixed and is characterized by carrying out adhesion closure while a periphery of this filmy light emitting device formed in said 1st and 2nd substrates is surrounded by a resin layer containing two or more particles.
The 1st substrate that has the flat surface in which a filmy light emitting device was formed.
The flat surface in which a filmy light emitting device was formed.

[Claim 5]It is a light emitting device characterized by comprising the following which the 2nd substrate of a light transmittance state countered mutually, and has been arranged, And a luminescent device when a periphery of a luminous layer is surrounded by a resin layer containing two or more particles, moreover separates an interval with a constant substrate of said couple by this resin layer and pastes up, wherein adhesion closure of said luminous layer is carried out.
The 1st substrate that has the flat surface where a filmy light emitting device of light reflex nature was formed in the surface.
The shape of flat surface type.

[Claim 6]It is a light emitting device characterized by comprising the following which the 2nd substrate of a light transmittance state countered mutually, and has been arranged, And a luminescent device when a periphery of a luminous layer is surrounded by a resin layer containing two or more particles, moreover separates an interval with a constant substrate of said couple by this resin layer and pastes up, wherein adhesion closure of said luminous layer is carried out.
The 1st substrate of light reflex nature which has the flat surface where a filmy light emitting device of a light transmittance state was formed in the surface.
The shape of flat surface type.

[Claim 7]The luminescent device according to claim 4 being the element which carried out stick forming of the layer in which a light emitting device formed in said 1st and 2nd substrates contains a transparent electrode, an electron hole transporting bed, a luminous layer, and an electrode layer at least one by one.
[Claim 8]The luminescent device according to claim 5 being the element which carried out stick forming of the layer in which a light emitting device formed in said 1st substrate contains a reflector, a luminous layer, and a transparent electrode layer at least one by one.
[Claim 9]The luminescent device according to claim 6 being the element which carried out stick forming of the layer in which a light emitting device formed in said 1st substrate contains a transparent electrode, a luminous layer, and a transparent electrode layer at least one by one.
[Claim 10]A luminescent device given in claims 5, 6, 8, and 9, wherein a light filter is formed in an inner surface of said 2nd substrate.
[Claim 11]A luminescent device given in claims 5, 6, 8, and 9, wherein said light filter is a wavelength selection reflexibility filter.
[Claim 12]a luminescent device given in claims 2-11 which said two or more particles contained in a glue line are hard particles, and the particle diameter is about one or less law, and are characterized by the maximum droplet size being in the range of 5 to 100 microns.
[Claim 13]A luminescent device given in claims 2-11, wherein said two or more particles contained in a glue line are hygroscopic particles, and and the mean particle diameter is 5 microns or more. [the particle diameter] [about one]
[Claim 14]A luminescent device given in claims 2-11 which serve as two or more hard particles to which particles contained in said resin layer have fixed particle diameter from a hygroscopic medium which has the particle diameter not more than it, and are characterized by particle diameter of hard particles being 5 microns or more [Claim 15]A luminescent device given in claims 2-11, wherein said hard particle is a glass bead or a piece of glass fiber.

DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Field of the Invention]This invention relates to the spontaneous light type display device (EL) by electroluminescence.
It is [raising especially the reliability of an organic EL device, and] a thing smoothly

with the purpose.

[0002]
[Description of the Prior Art]Development of low power consumption and a high-definition monotonous type display device is activating with development of high-advancement-in-information-technology multimedia society. A nonluminescent type liquid crystal display element establishes the position by making low power consumption into the feature, and the application to a Personal Digital Assistant etc. and the further high performance-ization are following it.
[0003]On the other hand, a spontaneous light type display device cannot be easily influenced by outdoor daylight, and development of an electroluminescence type display (EL) is activating it from the recognition in the interior of a room being easy towards substitution of the conventional CRT and also the big screen display with realization difficult in CRT, or realization of a super-high definition display.
[0004]Tongues on a substrate in 1987 The electrode layer for hole injections, an organic electron hole transporting bed, Have proposed the organic EL device of the structure by which stick forming was carried out in the organic electron-transport-property luminous layer and the electrode layer for electron injections, and Since, (reference : C.W.Tang etal. Appl. Phys. Lett. Vol.51, p.913(1987)), In addition to this element being a monotonous type spontaneous light corpuscle child, it is low power consumption, and captures the big spotlight from high-intensity, a high speed response, and a wide viewing angle display being possible, and the research and development about an organic electroluminescence display are activating.
[0005]An image display element has come [the alphanumeric display device especially according to organic electroluminescence these days was put in practical use, and also] to be made as an experiment.
[0006]The outline composition of the conventional organic EL device is shown using drawing 14. The anode 1402 which has the comparatively big ionization potential of indium oxide tin (ITO) etc., and becomes with a transparent conductive thin film with easy pouring of an electron hole is formed on the glass substrate 1401.
[0007]next, the organic layer 1403 which is boiled all over almost [of the surface] and which adhered to the electron hole transporting bed and the luminous layer of electron transport property one by one is formed. And the negative pole 1404 which has comparatively low work functions, such as a silver Magnesium alloy (AgMg), and becomes by the easy metal layer of pouring of an electron is formed in the surface.
[0008]The substrate (back plate) 1407 which has concave shape sticks with the glass substrate 1401 and the resin 1405, and is installed in the element side, and the inside is filled up with the inactive gas 1408.
[0009]Although the luminous layer of electron transport property generally has a low work function as compared with metal, pouring and its transportation of an electron can realize it comparatively easily by using the metal which has low work functions, such as an AgMg alloy, as the negative pole.
[0010]Since an electron hole transporting bed has comparatively big ionization potential, pouring and its transportation of an electron hole can be realized comparatively easily by using a big material of the ionization potential of indium oxide tin (ITO) etc. as the anode.

[0011]Then, an electron hole is poured into an electron hole transporting bed from the anode (ITO) 1402 by impressing positive direct current voltage to the anode to the negative pole, When an electron is poured into the luminous layer of electron transport property from the negative pole 1404 and also these join together in the luminous layer of the joint part neighborhood of an electron hole transporting bed and an electron transport layer (luminous layer), an exciton is formed and the luminescence 1409 arises. As for this luminescence, observation is made through a transparent electrode and a substrate.
[0012]This luminescence principle is similar to the inorganic light emitting diode formed by gallium arsenide etc., and it can be made to correspond with luminescence by an electron and an electron hole recombining in a joint part neighborhood by pouring an electron and an electron hole into the compound semiconductor which the PN junction was made. and an electron transport layer is contrasted with N type compound semiconductor, and an electron hole transporting bed is made to contrast with P type compound semiconductor -- it can carry out.
[0013]However, since the moisture resistance of the organic electroluminescence medium used for an electric charge pouring layer or a luminous layer in the usual organic EL device shown above and the low work function material used as the negative pole and oxidation resistance were low, it was comparatively unreliable, and in addition to the life of an element of operation, the problem was also left behind to the shelf life. The nonluminescent part called a sunspot only by neglecting an element in the air especially about a shelf life, for example occurred, display quality deteriorated, moreover, the sunspot was expanded with the passage of time, the phenomenon of luminescence stopping in the whole element arising soon arose, and it was a practically very serious problem.
[0014]Although the point obscure about the factor which a sunspot generates is also left behind, By the defect of the dust which had adhered to the substrate face at the time of film production, a steam and the dust which adheres after film production, or a pinhole local at least serving as a core, and reacting to oxygen in the air, or moisture, When the part which an organic layer or catholyte exfoliated, and also exfoliated serves as a new defect and oxygen and water have influence there further, the case which the sunspot expands to the periphery rapidly focusing on the early point defect part is almost the case.
[0015]In order to prevent generating of a sunspot, the measure of losing thoroughly the local defect generated at the time of manufactures, such as removal of dust, is also considered, but. About 0.1 micrometer and since it is very thin, eliminating a local defect usually has the thickness of an organic thin film next to impossible by removing dust of the size not more than this, etc. substantially.
[0016]Then, the trial in which expansion of a sunspot is prevented has also been made by covering the surface of an element with resin etc. so that neither an organic layer nor catholyte may be exposed to direct moisture or oxygen after thin film forming. However, there was almost no resin which the resin which can be used since the resin which generally becomes with an organic substance has low solvent resistance is limited, and moisture resistance can fully secure practically.
[0017]Then, as shown also in a conventional example after all, in order to carry out seal enclosure and to seal by using the back plate which usually has crevice structure for the whole luminous layer element, ultraviolet curing resin etc. were used and the back plate was directly pasted up on the element substrate.

[0018]However, adhesive strength strong when glass substrates are directly pasted up on this appearance with ultraviolet curing resin is not securable, Especially, on the conditions of high-humidity/temperature high voltage, stress strong against resin was added by substrates by the difference in an expansion coefficient etc., when resin and a substrate begin to have exfoliated gradually as a result, external moisture etc. invaded from the crevice, and there was a fault that a sunspot grew up to be a light-emitting part of an organic luminous layer in connection with it.
[0019]Since the concave-shaped substrate is used for the back substrate, while processing a substrate into a concave and low-cost-izing being difficult, Since the surface was processed into concave shape and the surface became fine uneven shape, it is difficult for a back substrate to add new functions, such as forming a light emitting device and the controlling element of light, and a back plate was not able to be utilized effectively.
[0020]Since there is the necessity of being with the transparent substrate which has the flat surfaces, such as a glass substrate, as a substrate which forms a light emitting device in the conventional organic EL device since luminescence from an organic layer will be observed through a substrate, Arbitrary substrates, such as a metal substrate, a silicon substrate, a flexible substrate, could not be used, but the technical problem was left behind to the application and possibilities.
[0021]
[Problem(s) to be Solved by the Invention]As explained above, it was very difficult to be unable to realize firm seal closure on condition of highly humid and an elevated temperature in the conventional organic light emitting element, but to, realize a reliable long lasting display as a result. This invention conquering the fault of such a conventional organic light emitting element, and maintaining firm adhesion especially, by controlling the moisture which invades from the outside, it controls expansion of a sunspot and realizes a reliable display device.
[0022]
[Means for Solving the Problem]The 2nd substrate this invention is characterized by that comprises the following is arranged so that the surface may counter mutually, And a luminescent device, wherein adhesion closure of said luminous layer is carried out by adhering to a glue line which contains two or more particles in a periphery which has the shape of surface type with said 2nd flat substrate, separating an interval with a constant substrate of said 1st and 2nd couples by this glue line moreover, and pasting up.
The 1st substrate that has the shape of flat surface type and with which a filmy light emitting device was formed in the surface.
Shape with the periphery flat at least.
This invention is a luminescent device, wherein two or more of said a part or all of particles that are contained in said glue line consist of a hygroscopic medium.
[0023]
[Embodiment of the Invention](A 1st embodiment) It explains hereafter, referring to drawing 1 for the light emitting device concerning a 1st embodiment of this invention. In drawing 1, 101 is a glass substrate. In the surface, an electron hole. The transparent electrode which becomes with indium oxide tin for pouring in. (Anode) 102, triphenyldiamine. (N'-bis) [TPD[N,] (3-methylphenyl)-. (1, 1'-biphenyl)-4, the organic layer 103 which becomes by the organic luminous layer of the electron transport property which becomes with the electron hole transporting bed which becomes by 4'-diamine],

and an aluminum quinolinol complex (Alq [tris(8-hydroxyquino) aluminium]), and an electron. The catholyte 104 which becomes with the silver Magnesium alloy for pouring in is formed one by one.

[0024]The 2nd substrate (back plate) 107 that counters the substrate with which these films were formed and has a crevice is installed, It fills up with the resin 105 which the glass bead 106 with a particle diameter of about 20 microns contained in very small quantities between the flat portions of the periphery of the 2nd substrate with which the 1st substrate and 2nd substrate contact, and the glue line is formed. If an electric field is impressed between the anode 102 and the negative pole 104, from each electrode, an electron hole and an electron will be poured into an organic luminous layer, and light will be emitted. And the transparent anode 102 and the glass substrate 101 are penetrated, and the light 109 is emitted.

[0025]In this example, although the ultraviolet curing resin in which the glass bead which has the particle diameter of about 20 microns as a glue line between the glass substrate 101 and the back plate 107 was contained was used, by containing a glass particle, the adhesive strength between substrates becomes strong and, as a result, the reliability of a light emitting device is secured.

[0026]in order to clarify the effect by the structure of this invention, the particle diameter of the particles included in ultraviolet curing resin was changed, the element was produced, and the situation of expansion of the sunspot of a light-emitting part in the shelf test under the temperature of 60 ** and the atmosphere of humidity 95% of high-humidity/temperature was observed. And the time when the radius of a sunspot would be 50 microns from a practical viewpoint was considered to be a shelf life, and it asked for particle diameter and the relation of the shelf life. The result is shown in drawing 15.

[0027]When a shelf life is short when particles do not intervene so that clearly [in drawing 15], but it becomes 5 microns or more, it turns out that a shelf life is improved remarkably. An element life will become short if 100 microns is exceeded. An external water molecule or oxygen molecule passes the inside of a resin layer, and invades between substrates, and this is considered to originate in an element deteriorating, when a resin layer becomes thick.

[0028]Thus, the light emitting device which was excellent in the shelf life as compared with the element formed without using particles is realizable the particles which have fixed particle diameter, and by making 5 to 100-micron resin contain especially. Although the glass bead is used as particles here, it is not necessarily limited to this, and it will not be limited especially if the pieces of glass fiber, etc. are the particles which have the fixed hardness which can maintain the resin layer between substrates at fixed thickness.

[0029](A 2nd embodiment) Although the glass bead was used as particles in Example 1, it is possible by using a hygroscopic medium as particles to extend a shelf life further.

[0030]Hereafter, it explains, referring to drawing 2 for the light emitting device concerning a 2nd embodiment of this invention.

[0031]In drawing 2, 201 is a glass substrate. In the surface, an electron hole. The transparent electrode which becomes with indium oxide tin for pouring in. (Anode) 202, triphenyldiamine. (N'-bis) [TPD[N,] (3-methylphenyl)-. (1, 1'-biphenyl)-4, the organic layer 203 which becomes by the organic luminous layer of the electron transport property which becomes with the electron hole transporting bed which becomes by 4'-diamine],

and an aluminum quinolinol complex (Alq [tris(8-hydroxyquino) aluminium]), and an electron. The catholyte 204 which becomes with the silver Magnesium alloy for pouring in is formed one by one.

[0032]The 2nd substrate (back plate) 207 that counters the substrate with which these films were formed and has a crevice is installed, It fills up with the resin 205 which the zeolite particle 206 with a particle diameter of about 50 microns contained between the flat portions of the periphery of the 2nd substrate with which the 1st substrate and 2nd substrate contact, and the glue line is formed. By the completely same principle as Example 1, if an electric field is impressed between the anode 202 and the negative pole 204, from each electrode, an electron hole and an electron will be poured into an organic luminous layer, and light will be emitted. And the transparent anode 202 and the glass substrate 201 are penetrated, and the light 209 is emitted.

[0033]It became clear by making ultraviolet curing resin contain in this example by using a zeolite particle with a particle diameter of about 50 microns as a spacer that the shelf life in high-humidity/temperature became in 1500 hours or more.

[0034]Although zeolite was used as particles in the example, it is not necessarily limited to this, but zeolite, phosphorus pentoxide, silica gel, etc. should just be the media which have hygroscopicity. Although the particle diameter of zeolite particles was made to increase, even if it becomes 100 microns or more, it cannot observe, and particle diameter is not limited to 50 microns, either, but the reduction especially remarkable in a shelf life should just be 5 microns or more.

[0035](A 3rd embodiment) Although only the particles which have the particle diameter of definite shape in Example 2 were used, the selection range of the medium which has hygroscopicity is further expandable by carrying out functional separation of the particles for maintaining the thickness of a resin layer, and the particles which have a moisture absorption operation. Hereafter, it explains, referring to drawing 3 for the light emitting device concerning a 3rd embodiment of this invention.

[0036]In drawing 3, 301 is a glass substrate. In the surface, an electron hole. The transparent electrode which becomes with indium oxide tin for pouring in. (Anode) 302, triphenyldiamine. (N'-bis) [TPD[N,] (3-methylphenyl)-. (1, 1'-biphenyl)-4, the organic layer 303 which becomes by the organic luminous layer of the electron transport property which becomes with the electron hole transporting bed which becomes by 4'-diamine], and an aluminum quinolinol complex (Alq [tris(8-hydroxyquino) aluminium]), and an electron. The catholyte 304 which becomes with the silver Magnesium alloy for pouring in is formed one by one.

[0037]The 2nd substrate (back plate) 307 that counters the substrate with which these films were formed and has a crevice is installed, It fills up with the resin 305 which the glass bead 306A with a particle diameter of about 20 microns and the phosphorus pentoxide 306B contained between the flat portions of the periphery of the 2nd substrate with which the 1st substrate and 2nd substrate contact, and the glue line is formed. By the completely same principle as Examples 1 and 2, if an electric field is impressed between the anode 302 and the negative pole 304, from each electrode, an electron hole and an electron will be poured into an organic luminous layer, and light will be emitted. And the transparent anode 302 and the glass substrate 301 are penetrated, and the light 309 is emitted.

[0038]The means which is when the glass particle of fixed particle diameter and

hygroscopic particles are made to contain simultaneously can enable it to make the particle diameter of hygroscopic particles still smaller, and the number of the hygroscopic particles which can be contained in the resin layer which has the intensity more than fixed can make it increase in this example. As a result, it is possible for the particle surface product which has a moisture absorption operation to increase, and to puff up a moisture absorption effect remarkably.

[0039]In this example, it became clear by making ultraviolet curing resin contain phosphorus pentoxide as a desiccant by using glass particles with a particle diameter of about 20 microns as a spacer and also that that whose shelf life was about 1000 hours was extended in 3000 hours or more only by glass particles.

[0040]In this example, although phosphorus pentoxide was used as particles, it is not necessarily limited to this, but zeolite, silica gel, etc. should just be the media which have hygroscopicity. Although the particle diameter of the glass particle was made to increase, even if it becomes 100 microns or more, it cannot observe, and a glass particle system is not limited to 20 microns, either, but the reduction especially remarkable in a shelf life should just be 5 microns or more.

[0041](A 4th embodiment) Although the substrate which has a crevice in a back plate in Examples 1, 2, and 3 was used, the substrate which has flat shape can be used for a back plate by making an adhesion resin layer contain particles.

[0042]Hereafter, it explains, referring to drawing 4 for the light emitting device concerning a 4th embodiment of this invention.

[0043]In drawing 4, 401 is a glass substrate. In the surface, an electron hole. The transparent electrode which becomes with indium oxide tin for pouring in. (Anode) 402, triphenyldiamine. (N'-bis) [TPD[N,] (3-methylphenyl)-. (1, 1'-biphenyl)-4, the organic layer 403 which becomes by the organic luminous layer of the electron transport property which becomes with the electron hole transporting bed which becomes by 4'-diamine], and an aluminum quinolinol complex (Alq [tris(8-hydroxyquino) aluminium]), and an electron. The catholyte 404 which becomes with the silver Magnesium alloy for pouring in is formed one by one.

[0044]Counter the substrate with which these films were formed and the 2nd substrate 407 with the flat surface (back plate) is installed, It fills up with the resin 405 which the glass bead 406 with a particle diameter of about 20 microns contained in very small quantities between the peripheries of the 2nd substrate with which the 1st substrate and 2nd substrate contact, and the glue line is formed. If an electric field is impressed between the anode 402 and the negative pole 404, from each electrode, an electron hole and an electron will be poured into an organic luminous layer, and light will be emitted.

[0045]And the transparent anode 402 and the glass substrate 401 are penetrated, and the light 409 is emitted. Although the glass bead which has the particle diameter of about 20 microns was used as a glue line between the glass substrate 401 and the back plate 407 in this example, It is not necessarily limited to this, and it will not be limited especially if the pieces of glass fiber, etc. are the particles which have the fixed hardness which can maintain the resin layer between substrates at fixed thickness.

[0046](A 5th embodiment) Although the glass bead was used as particles in Example 4, it is possible by using a hygroscopic medium as particles to extend a shelf life further.

[0047]Hereafter, it explains, referring to drawing 5 for the light emitting device concerning a 5th embodiment of this invention.

[0048]In a figure, 501 is a glass substrate. In the surface, an electron hole. The transparent electrode which becomes with indium oxide tin for pouring in. (Anode) 502, triphenyldiamine. (N'-bis) [TPD[N,] (3-methylphenyl)-. (1, 1'-biphenyl)-4, the organic layer 503 which becomes by the organic luminous layer of the electron transport property which becomes with the electron hole transporting bed which becomes by 4'-diamine], and an aluminum quinolinol complex (Alq [tris(8-hydroxyquino) aluminium]), and an electron. The catholyte 504 which becomes with the silver Magnesium alloy for pouring in is formed one by one.

[0049]The 2nd substrate (back plate) 507 that counters the substrate with which these films were formed and has the flat surface is installed, It fills up with the resin 505 which the zeolite particle 506 with a particle diameter of about 50 microns contained between the flat portions of the periphery of the 2nd substrate with which the 1st substrate and 2nd substrate contact, and the glue line is formed. By the completely same principle as Example 1, if an electric field is impressed between the anode 502 and the negative pole 504, from each electrode, an electron hole and an electron will be poured into an organic luminous layer, and light will be emitted. And the transparent anode 502 and the glass substrate 501 are penetrated, and the light 509 is emitted.

[0050]In this example, although zeolite was used as particles, it is not necessarily limited to this, but zeolite, phosphorus pentoxide, silica gel, etc. should just be the media which have hygroscopicity. Although the particle diameter of zeolite particles was made to increase, even if it becomes 100 microns or more, it cannot observe, and a particle system is not limited to 50 microns, either, but the reduction especially remarkable in a shelf life should just be 5 microns or more.

[0051](A 6th embodiment) Although only the particles which have the particle diameter of definite shape in Example 5 were used, the selection range of the medium which has hygroscopicity is further expandable by carrying out functional separation of the particles for maintaining the thickness of a resin layer, and the particles which have a moisture absorption operation.

[0052]Hereafter, it explains, referring to drawing 6 for the light emitting device concerning a 6th embodiment of this invention.

[0053]In drawing 6, 601 is a glass substrate. In the surface, an electron hole. The transparent electrode which becomes with indium oxide tin for pouring in. (Anode) 602, triphenyldiamine. (N'-bis) [TPD[N,] (3-methylphenyl)-. (1, 1'-biphenyl)-4, the organic layer 603 which becomes by the organic luminous layer of the electron transport property which becomes with the electron hole transporting bed which becomes by 4'-diamine], and an aluminum quinolinol complex (Alq [tris(8-hydroxyquino) aluminium]), and an electron. The catholyte 604 which becomes with the silver Magnesium alloy for pouring in is formed one by one.

[0054]The 2nd substrate (back plate) 607 that counters the substrate with which these films were formed and has the flat surface is installed, It fills up with the resin 605 which the glass bead 606A with a particle diameter of about 20 microns and the phosphorus pentoxide 606B which has the particle diameter not more than it contained between the flat portions of the periphery of the 2nd substrate with which the 1st substrate and 2nd substrate contact, and the glue line is formed. By the completely same principle as Examples 1 and 2, if an electric field is impressed between the anode 602 and the negative pole 604, from each electrode, an electron hole and an electron will be poured

into an organic luminous layer, and light will be emitted. And the transparent anode 602 and the glass substrate 601 are penetrated, and the light 609 is emitted.
[0055]The means which is when the glass particle of fixed particle diameter and hygroscopic particles are made to contain simultaneously can enable it to make the particle diameter of hygroscopic particles still smaller, and the number of the hygroscopic particles which can be contained in the resin layer which has the intensity more than fixed can make it increase in this example. As a result, it is possible for the particle surface product which has a moisture absorption operation to increase, and to puff up a moisture absorption effect remarkably.
[0056]In this example, although phosphorus pentoxide was used as particles, it is not necessarily limited to this, but zeolite, silica gel, etc. should just be the media which have hygroscopicity. Although the particle diameter of the glass particle was made to increase, even if it becomes 100 microns or more, it cannot observe, and a glass particle system is not limited to 20 microns, either, but the reduction especially remarkable in a shelf life should just be 5 microns or more.
[0057]Although the surface of catholyte is directly exposed by inactive gas in the example, it is possible to raise reliability further by covering with the insulating layer which becomes with silicon oxide etc.
[0058](A 7th embodiment) Although the substrate which has flat shape in a back plate in Examples 4, 5, and 6 was used, a light emitting device can be formed also in this back plate.
[0059]Hereafter, it explains, referring to drawing 7 for the light emitting device concerning a 7th embodiment of this invention.
[0060]In drawing 7-7, 7011 is a glass substrate (the 1st substrate). In the surface, an electron hole. The transparent electrode which becomes with indium oxide tin for pouring in. (The 1st electrode) 7021, triphenyldiamine. (N'-bis) [TPD[N,] (3-methylphenyl)-. (1, 1'-biphenyl)-4, the organic layer 7031 which comprised an electron-transport-property luminous layer which becomes with the electron hole transporting bed which becomes by 4'-diamine], and an aluminum quinolinol complex (Alq [tris(8-hydroxyquino) aluminium]), and an electron. The catholyte (the 2nd electrode) 7041 which becomes with the silver Magnesium alloy for pouring in is formed one by one.
[0061]Counter the substrate with which these films were formed, and the 2nd substrate 7012 with the flat surface is installed, and in the surface. An electron hole. The transparent electrode which becomes with indium oxide tin for pouring in. (The 3rd electrode) 7022, triphenyldiamine. (N'-bis) [TPD[N,] (3-methylphenyl)-. (1, 1'-biphenyl)-4, the organic layer 7032 which becomes by the electron-transport-property luminous layer which becomes with the electron hole transporting bed which becomes by 4'-diamine], and an aluminum quinolinol complex (Alq [tris(8-hydroxyquino) aluminium]), and an electron. The catholyte (the 4th electrode) 7042 which becomes with the silver Magnesium alloy for pouring in is formed one by one.
[0062]The resin 705 which the glass particle 706 with a particle diameter of about 20 microns contained in very small quantities is installed in the periphery of the 1st substrate 7011 and the 2nd substrate 7012, and while adhesion maintenance of the substrate is carried out by this resin layer, the luminous layer element is closed.If an electric field is impressed between the anode (the 1st electrode) 7021, the negative pole (the 2nd electrode) 7041 and the anode (the 3rd electrode) 7022, and the negative pole (the 4th

electrode) 7042, from each electrode, an electron hole and an electron will be poured into an organic luminous layer, and light will be emitted.
[0063]And the green luminescence 7091 which penetrates the transparent anode 7021 and the glass substrate 7011, and the green luminescence 7092 which penetrates the transparent anode 7022 and the glass substrate 7012 are observed from both sides of a substrate.
[0064]The display of the new function which it becomes possible to observe information which is the same or is different from both sides of a plate-like luminescent device by this invention, and is not in the former can be realized. Although luminescence of the same color is realized by forming the same luminous layer in the 1st substrate and 2nd substrate in this example, It does not necessarily need to be the same and it is obvious that it is also possible to realize luminescence of a color which is different by both sides by changing the kind of luminous layer formed in each substrate.
[0065]Using indium oxide tin as 1st and 3rd electrode layers, although the magnesium silver alloy was used as 2nd and 4th electrode layers, it is not necessarily limited to such materials, what is necessary is just a conductor transparent as 1st and 3rd electrode layers -- the 2nd and 4th electrode layers -- carrying out -- metal etc. should just be the conductors of light reflex nature.
[0066]Although the glass bead which has the particle diameter of about 20 microns is used as a glue line between the 1st glass substrate 7011 and the 2nd glass substrate 7012 in this example, it is not necessarily limited to this, It will not be limited especially if the pieces of glass fiber, etc. are the particles which have the fixed hardness which can maintain the resin layer between substrates at fixed thickness.
[0067]Although the surface of catholyte (the 2nd electrode and 4th electrode) is directly exposed by inactive gas in this example, it is possible to raise reliability further by covering with the insulating layer which becomes with silicon oxide etc.
[0068](An 8th embodiment) Although the glass bead was used as particles in Example 7, it is possible by using a hygroscopic medium as particles to extend a shelf life further. Hereafter, it explains, referring to drawing 8 for the light emitting device concerning an 8th embodiment of this invention.
[0069]In drawing 8, 8011 is a glass substrate (the 1st substrate). In the surface, an electron hole. The transparent electrode which becomes with indium oxide tin for pouring in. (The 1st electrode) 8021, triphenyldiamine. (N'-bis) [TPD[N,] (3-methylphenyl)-. (1, 1'-biphenyl)-4, the organic layer 8031 which comprised an electron-transport-property luminous layer which becomes with the electron hole transporting bed which becomes by 4'-diamine], and an aluminum quinolinol complex (Alq [tris(8-hydroxyquino) aluminium]), and an electron. The catholyte (the 2nd electrode) 8041 which becomes with the silver Magnesium alloy for pouring in is formed one by one.
[0070]Counter the substrate with which these films were formed, and the 2nd substrate 8012 with the flat surface is installed, and in the surface. An electron hole. The transparent electrode which becomes with indium oxide tin for pouring in. (The 3rd electrode) 8022, triphenyldiamine. (N'-bis) [TPD[N,] (3-methylphenyl)-. (1, 1'-biphenyl)-4, the organic layer 8032 which becomes by the electron-transport-property luminous layer which becomes with the electron hole transporting bed which becomes by 4'-diamine], and an aluminum quinolinol complex (Alq [tris(8-hydroxyquino) aluminium]), and an electron. The catholyte (the 4th electrode) 8042 which becomes with

the silver Magnesium alloy for pouring in is formed one by one.
[0071]The resin layer 805 which the zeolite particle (desiccant) 806 with a particle diameter of about 50 microns contained is installed in the periphery of the 1st substrate 8011 and the 2nd substrate 8012, and while adhesion maintenance of the substrate is carried out by this resin layer, the luminous layer element is closed.
[0072]If an electric field is impressed between the anode (the 1st electrode) 8021, the negative pole (the 2nd electrode) 8041 and the anode (the 3rd electrode) 8022, and the negative pole (the 4th electrode) 8042, from each electrode, an electron hole and an electron will be poured into an organic luminous layer, and light will be emitted. And the green luminescence 8091 which penetrates the transparent anode 8021 and the glass substrate 8011, and the green luminescence 8092 which penetrates the transparent anode 8022 and the glass substrate 8012 are observed from both sides of a substrate.
[0073]Although luminescence of the same color is realized by forming the same luminous layer in the 1st substrate and 8th substrate also in this example, It does not necessarily need to be the same and it is obvious that it is also possible to realize luminescence of a color which is different by both sides by changing the kind of luminous layer formed in each substrate.
[0074]Using indium oxide tin as 1st and 3rd electrode layers, although the magnesium silver alloy was used as 2nd and 4th electrode layers, it is not necessarily limited to such materials, what is necessary is just a conductor transparent as 1st and 3rd electrode layers -- the 2nd and 4th electrode layers -- carrying out -- metal etc. should just be the conductors of light reflex nature.
[0075]In this example, although zeolite was used as particles, it is not necessarily limited to this, but zeolite, phosphorus pentoxide, silica gel, etc. should just be the media which have hygroscopicity. Although the particle diameter of zeolite particles was made to increase, even if it becomes 100 microns or more, it cannot observe, and particle diameter is not limited to 50 microns, either, but the reduction especially remarkable in a shelf life should just be 5 microns or more.
[0076](A 9th embodiment) Although only the particles which have the particle diameter of definite shape in Example 8 were used, the selection range of the medium which has hygroscopicity is further expandable by carrying out functional separation of the particles for maintaining the thickness of a resin layer, and the particles which have a moisture absorption operation. Hereafter, it explains, referring to drawing 9 for the light emitting device concerning a 9th embodiment of this invention.
[0077]In drawing 9, 9011 is a glass substrate (the 1st substrate). In the surface, an electron hole. The transparent electrode which becomes with indium oxide tin for pouring in. (The 1st electrode) 9021, triphenyldiamine. (N'-bis) [TPD[N,] (3-methylphenyl)-. (1, 1'-biphenyl)-4, the organic layer 9031 which comprised an electron-transport-property luminous layer which becomes with the electron hole transporting bed which becomes by 4'-diamine], and an aluminum quinolinol complex (Alq [tris(8-hydroxyquino) aluminium]), and an electron. The catholyte (the 2nd electrode) 9041 which becomes with the silver Magnesium alloy for pouring in is formed one by one.
[0078]Counter the substrate with which these films were formed, and the 2nd substrate 9012 with the flat surface is installed, and in the surface. An electron hole. The transparent electrode which becomes with indium oxide tin for pouring in. (The 3rd electrode) 9022, triphenyldiamine. (N'-bis) [TPD[N,] (3-methylphenyl)-. (1, 1'-

biphenyl)-4, the organic layer 9032 which becomes by the electron-transport-property luminous layer which becomes with the electron hole transporting bed which becomes by 4'-diamine], and an aluminum quinolinol complex (Alq [tris(8-hydroxyquino) aluminium]), and an electron. The catholyte (the 4th electrode) 9042 which becomes with the silver Magnesium alloy for pouring in is formed one by one.
[0079]The resin 905 which the glass bead 906A with a particle diameter of about 20 microns and the phosphorus pentoxide 906B which has the particle diameter not more than it contained is installed in the periphery of the 1st substrate 9011 and the 2nd substrate 9012, and while adhesion maintenance of the substrate is carried out by this resin layer, the luminous layer element is closed.
[0080]If an electric field is impressed between the anode (the 1st electrode) 9021, the negative pole (the 2nd electrode) 9041 and the anode (the 3rd electrode) 9022, and the negative pole (the 4th electrode) 9042, from each electrode, an electron hole and an electron will be poured into an organic luminous layer, and light will be emitted. And the green luminescence 9091 which penetrates the transparent anode 9021 and the glass substrate 9011, and the green luminescence 9092 which penetrates the transparent anode 9022 and the glass substrate 9012 are observed from both sides of a substrate.
[0081]Although luminescence of the same color is realized by forming the same luminous layer in the 1st substrate and 2nd substrate in this example, It does not necessarily need to be the same and it is obvious that it is also possible to realize luminescence of a color which is different by both sides by changing the kind of luminous layer formed in each substrate. Using indium oxide tin as 1st and 3rd electrode layers, although the magnesium silver alloy was used as 2nd and 4th electrode layers, it is not necessarily limited to such materials, what is necessary is just a conductor transparent as 1st and 3rd electrode layers -- the 2nd and 4th electrode layers -- carrying out -- metal etc. should just be the conductors of light reflex nature.
[0082]The means which is when the glass particle of fixed particle diameter and hygroscopic particles are made to contain simultaneously can enable it to make the particle diameter of hygroscopic particles still smaller, and the number of the hygroscopic particles which can be contained in the resin layer which has the intensity more than fixed can make it increase in this example. As a result, it is possible for the particle surface product which has a moisture absorption operation to increase, and to puff up a moisture absorption effect remarkably.
[0083]In this example, although phosphorus pentoxide was used as particles, it is not necessarily limited to this, but zeolite, silica gel, etc. should just be the media which have hygroscopicity. Although the particle diameter of the glass particle was made to increase, even if it becomes 100 microns or more, it cannot observe, and a glass particle system is not limited to 20 microns, either, but the reduction especially remarkable in a shelf life should just be 5 microns or more.
[0084]Although the surface of catholyte is directly exposed by inactive gas in the example, it is possible to raise reliability further by covering with the insulating layer which becomes with silicon oxide etc.
[0085](A 10th embodiment) Although luminescence from an organic layer was observed through the substrate in the above example, by considering it as a substrate and the element structure which takes out luminescence from an opposite hand, it becomes unnecessary for the substrate which forms a light emitting device to be transparent, and

the optionality of substrate selection improves.
[0086]Hereafter, it explains, referring to drawing 10 for the light emitting device concerning a 10th embodiment of this invention.
[0087]In drawing 10, 1001 is a glass substrate. In the surface, an electron. The metal cathode layer 1002 which becomes with the silver Magnesium alloy for pouring in, the organic luminous layer and triphenyldiamine of electron transport property which become with an aluminum quinolinol complex (Alq [tris(8-hydroxyquino) aluminium]). (N'-bis) [TPD[N,] Transparent electrode (anode) 1004** which becomes with indium oxide tin for pouring in the organic layer 1003 and electron hole which become by the electron hole transporting bed which becomes by (3-methylphenyl)-(1 and 1'-biphenyl)-4 and 4'-diamine] is formed one by one.
[0088]The transparent glass substrate (back plate) 1007 which counters the substrate with which these films were formed and has the flat surface is installed, Between the flat portions of the periphery of the substrate 1001 with which the element was formed, and the 2nd substrate with which the back plate 1007 contacts. It fills up with the glass bead 1006A of about 20 microns of ******, and the ultraviolet curing resin 1005 which the zeolite particles 1006B which have the particle diameter not more than it contained, and the glue line is formed. If an electric field is impressed between the negative pole 1002 and the anode 1004, from each electrode, an electron and an electron hole will be poured into an organic luminous layer, and light will be emitted. And the transparent anode 1004 and the rear glass substrate 1007 are penetrated, and the light 1009 is emitted.
[0089]In this example, although the monolayer of the aluminum quinol complex (Alq [tris(8-hydroxyquino) aluminium]) was used as a luminous layer, It is not necessarily limited to this luminescent material, but coloring matter may be added, in order to use the luminous layer which shows the different luminescent color and to control luminous efficiency and the luminescent color. In this example, although the glass particle of fixed particle diameter and hygroscopic particles are made to contain simultaneously in ultraviolet curing resin, only a glass particle is not cared about. However, the number of the hygroscopic particles which can be contained in the resin layer which has the intensity more than fixed can make it increase by being with a mixed granule child.
[0090]In this example, although phosphorus pentoxide was used as particles, it is not necessarily limited to this, but zeolite, silica gel, etc. should just be the media which have hygroscopicity. Although the particle diameter of the glass particle was made to increase, even if it becomes 100 microns or more, it cannot observe, and a glass particle system is not limited to 20 microns, either, but the reduction especially remarkable in a shelf life should just be 5 microns or more.
[0091]Although the surface of catholyte is directly exposed by inactive gas in the example, it is possible to raise reliability further by covering with the insulating layer which becomes with silicon oxide etc.
[0092]Although the glass substrate is used as an element substrate in the example, it is not necessary to be necessarily a glass substrate, and even if it is a silicon substrate, a metal substrate or a plastic plate, etc., it is convenient in any way. However, it is obvious that it is necessary to adopt composition which an inter-electrode short circuit does not produce, such as installing an insulator layer in a substrate face further in using a conductive substrate.
[0093](The 11th example) In the aforementioned example, although the electrode of light

reflex nature was first formed in the element substrate, a reflecting layer does not necessarily need to work as an electrode of a direct light emitting device, and the transparent electrode may be formed via the light reflection layer. It explains referring to drawing 11 for the light emitting device concerning an 11th embodiment of this invention.

[0094]In drawing 4, 1101 is a glass substrate. Reflecting layer 1102' which becomes with an aluminum thin film is formed in the surface, On it an electron hole. The transparent electrode which becomes with indium oxide tin for pouring in. (Anode) 1102, triphenyldiamine. (N'-bis) [TPD[N,] (3-methylphenyl)-. (1, 1'-biphenyl)-4, the organic layer 1103 which becomes by the organic luminous layer of the electron transport property which becomes with the electron hole transporting bed which becomes by 4'-diamine], and an aluminum quinolinol complex (Alq [tris(8-hydroxyquino) aluminium]), and an electron. The catholyte 1104 which becomes with the silver Magnesium alloy for pouring in is formed one by one. The thickness of catholyte is a light transmittance state here as thinly as about 0.01 micron.

[0095]Counter the substrate 1101 with which the above film was formed, and the transparent rear glass board 1107 is installed, The periphery which the substrate of ** contacts is filled up with the resin 1105 which a little zeolite which has the glass bead 1106A with a particle diameter of about 20 microns and the particle diameter not more than it contained, and the glue line is formed. If an electric field is impressed between the transparent anode 1102 and the transparent negative pole 1104, from each electrode, an electron hole and an electron will be poured into an organic luminous layer, and light will be emitted. And the light emitted to the negative pole side penetrates the glass substrate 1107, and radiation discharge is carried out to the exterior 1109.

[0096]In this example, although the monolayer of the aluminum quinol complex (Alq [tris(8-hydroxyquino) aluminium]) was used as a luminous layer, It is not necessarily limited to this luminescent material, but coloring matter may be added, in order to use the luminous layer which shows the different luminescent color and to control luminous efficiency and the luminescent color.

[0097]In this example, although a 20-micron glass particle is contained and used for resin like Example 10, the light emitting device excellent in the shelf life is realizable by using hard glass particles and desiccant of 5 microns or more. Although the glass bead is used as particles also here, it is not necessarily limited to this, and it will not be limited especially if the pieces of glass fiber, etc. are the particles which have the fixed hardness which can maintain the resin layer between substrates at fixed thickness. Although the desiccant also uses zeolite, it is not limited to this. Although the surface of catholyte is directly exposed by inactive gas in this example, it is possible to raise reliability further by covering with the insulating layer which becomes with silicon oxide etc.

[0098]Although the glass substrate is used as an element substrate in the example, it is not necessary to be necessarily a glass substrate, and even if it is a silicon substrate, a metal substrate or a plastic plate, etc., it is convenient in any way. However, it is obvious that it is necessary to adopt composition which an inter-electrode short circuit does not produce, such as installing an insulator layer in a substrate face further in using a conductive substrate.

[0099](The 12th example) In Examples 10 and 11, although direct observation of the luminescence from an organic layer was carried out through the rear glass substrate, it

becomes possible by installing a light filter in the inner surface or outside surface of a rear glass substrate to take out only the light of specific wavelength. For example, it is possible to realize a colored presentation easily by forming two or more light emitting devices divided into the pixel at the element substrate, making an element correspond and installing red and a green and blue filter. Hereafter, it explains, referring to drawing 12 for the light emitting device concerning a 12th embodiment of this invention.

[0100]In drawing 12, 1201 is a glass substrate. In the surface, an electron. The metal cathode layer 1202 which becomes with the silver Magnesium alloy for pouring in, the organic luminous layer and triphenyldiamine of electron transport property which become with an aluminum quinolinol complex (Alq [tris(8-hydroxyquino) aluminium]). (N'-bis) [TPD[N,] Transparent electrode (anode) 1204** which becomes with indium oxide tin for pouring in the organic layer 1203 and electron hole which become by the electron hole transporting bed which becomes by (3-methylphenyl)-(1 and 1'-biphenyl)-4 and 4'-diamine] is formed one by one.

[0101]The transparent glass substrate (back plate) 1207 in which the substrate with which these films were formed was countered, and the light filter 1210 was installed in the surface is installed, The periphery which the substrate 1201 with which the element was formed, and the back plate 1207 with the flat surface contact is filled up with the glass bead 1206A with a particle diameter of about 20 microns and the ultraviolet curing resin 1205 which the zeolite particles 1206B which have the particle diameter not more than it contained, and the glue line is formed. If an electric field is impressed between the negative pole 1202 and the anode 1204, from each electrode, an electron and an electron hole will be poured into an organic luminous layer, and light will be emitted. And the transparent anode 1204, the light filter 1210, and the rear glass substrate 1207 are penetrated, and red and the green and blue light 1209 are emitted.

[0102]In this example, although the monolayer of the aluminum quinol complex (Alq [tris(8-hydroxyquino) aluminium]) was used as a luminous layer, It is possible to adopt organic layers which show near luminescence comparatively white, such as a layer by which the coloring matter which emits yellow to a laminated structure and a blue luminescent material with the luminous layer which shows the luminescent color which is not necessarily limited to this luminescent material, but is different was added.

[0103]In this example, although the glass particle of fixed particle diameter and hygroscopic particles are made to contain simultaneously in ultraviolet curing resin, as already stated, only a glass particle is not cared about.

[0104]The surface of the transparent electrode may be covered with the insulating layer which becomes with silicon oxide etc. further. Although the structure of the element is with the almost same structure as Example 10, the same structure as Example 11 may be sufficient as it.

[0105]Although the glass substrate is used as an element substrate in the example, necessarily not being limited to a glass substrate is same.

[0106](The 13th example) In Example 13, although the absorbed type light filter was installed in the rear glass substrate surface, it becomes possible by installing a wavelength selection reflexibility filter to take out only the light of specific wavelength efficiently.

[0107]Hereafter, it explains, referring to drawing 13 for the light emitting device concerning a 13th embodiment of this invention.

[0108]In drawing 13, 1301 is a glass substrate. In the surface, an electron. The metal

cathode layer 1302 which becomes with the silver Magnesium alloy for pouring in, the organic luminous layer and triphenyldiamine of electron transport property which become with an aluminum quinolinol complex (Alq [tris(8-hydroxyquino) aluminium]). (N'-bis) [TPD[N,] Transparent electrode (anode) 1304** which becomes with indium oxide tin for pouring in the organic layer 1303 and electron hole which become by the electron hole transporting bed which becomes by (3-methylphenyl)-(1 and 1'-biphenyl)-4 and 4'-diamine] is formed one by one.

[0109]The transparent glass substrate (back plate) 1307 in which the substrate with which these films were formed was countered, and red and the green and blue wavelength selection reflexibility filter 1310 were installed in the surface is installed, The periphery which the substrate 1301 with which the element was formed, and the back plate 1307 with the flat surface contact is filled up with the glass bead 1306A with a particle diameter of about 20 microns and the ultraviolet curing resin 1305 which the zeolite particles 1306B which have the particle diameter not more than it contained, and the glue line is formed.

[0110]If an electric field is impressed between the negative pole 1302 and the anode 1304, from each electrode, an electron and an electron hole will be poured into an organic luminous layer, and light will be emitted. Since only the light of the specified wavelength determined in the character of the wavelength selection reflexibility filter 1310 among the lights which reflect with a reflector the light which emits light to the element substrate side, and pass the transparent electrode 1304 is reflected, While the light of the specific wavelength emits light efficiently, the rear glass substrate 1307 is penetrated and red with very high purity and the green and blue light 1309 are emitted.

[0111]In this example, although the monolayer of the aluminum quinol complex (Alq [tris(8-hydroxyquino) aluminium]) was used as a luminous layer, It is possible to adopt organic layers which show near luminescence comparatively white, such as a layer by which the coloring matter which emits yellow to a laminated structure and a blue luminescent material with the luminous layer which shows the luminescent color which is not necessarily limited to this luminescent material, but is different was added.

[0112]In this example, although the glass particle of fixed particle diameter and hygroscopic particles are made to contain simultaneously in ultraviolet curing resin, as already stated, only a glass particle is not cared about.

[0113]The surface of the transparent electrode may be covered with the insulating layer which becomes with silicon oxide etc. further. Although the structure of the element is with the almost same structure as Example 10, the same structure as Example 11 may be sufficient as it.

[0114]Although the glass substrate is used as an element substrate in the example, necessarily not being limited to a glass substrate is same.

[0115]As the above example showed, this invention conquers the fault of the conventional organic electroluminescence devices, provides the high-reliability and the highly efficient spontaneous light type monotonous type display device which are not in the former, and can expect an industrially very big effect.

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]
[Drawing 1]The sectional view of the light emitting device concerning a 1st embodiment of this invention
[Drawing 2]The sectional view of the light emitting device concerning a 2nd embodiment of this invention
[Drawing 3]The sectional view of the light emitting device concerning a 3rd embodiment of this invention
[Drawing 4]The sectional view of the light emitting device concerning a 4th embodiment of this invention
[Drawing 5]The sectional view of the light emitting device concerning a 5th embodiment of this invention
[Drawing 6]The sectional view of the light emitting device concerning a 6th embodiment of this invention
[Drawing 7]The sectional view of the light emitting device concerning a 7th embodiment of this invention
[Drawing 8]The sectional view of the light emitting device concerning an 8th embodiment of this invention
[Drawing 9]The sectional view of the light emitting device concerning a 9th embodiment of this invention
[Drawing 10]The sectional view of the light emitting device concerning a 10th embodiment of this invention
[Drawing 11]The sectional view of the light emitting device concerning an 11th embodiment of this invention
[Drawing 12]The sectional view of the light emitting device concerning a 12th embodiment of this invention
[Drawing 13]The sectional view of the light emitting device concerning a 13th embodiment of this invention
[Drawing 14]The figure showing the outline structure of the conventional organic light emitting element
[Drawing 15]The figure showing the diameter of a particle which adhering resin is made to contain, and the relation of the shelf life of a light emitting device
[Description of Notations]
101 Glass substrate
102 Transparent electrode
103 Organic layer
104 Negative pole
105 Resin
106 Glass bead
107 Back plate
108 Inactive gas